

**Claims**

1. A land-based cable station for an undersea optical transmission system, comprising:
  - submarine line terminal equipment (SLTE) for processing terrestrial traffic received from an external source;
  - power feed equipment for supplying electrical power to active undersea components of the transmission system;
  - an element management system for configuring and obtaining status information from the transmission system;
  - a cable termination box in which an undersea cable terminates; and
  - wherein said SLTE includes:
    - terrestrial optical transmission equipment receiving the terrestrial traffic and generating optical signals in response thereto; and
    - an interface device providing signal conditioning to the optical signals received from the terrestrial optical transmission equipment so that the optical signals are suitable for transmission through the undersea optical transmission system.
2. The cable station of claim 1 wherein said terrestrial optical equipment is a SONET/SDH terminal.
3. The cable station of claim 1 wherein said terrestrial optical terminal is an ATM terminal.
4. The cable station of claim 1 wherein said terrestrial optical terminal is a Gigabit Ethernet terminal.
5. The cable station of claim 1 wherein said undersea optical transmission system is a WDM transmission system.

6. The cable station of claim 1 wherein the interface device is configured to perform at least one signal conditioning process selected from the group consisting of gain equalization, bulk dispersion compensation, optical amplification, Raman amplification, dispersion slope compensation, PMD compensation, load balancing, and performance monitoring.

7. The cable station of claim 1 wherein the external source from which the terrestrial traffic is received is a terrestrial point-of-presence.

8. The cable station of claim 1 wherein said interface device includes line monitoring equipment.

9. The cable station of claim 8 wherein line monitoring equipment is a COTDR arrangement.

10. The cable station of claim 1 wherein said interface device includes means for supplying pump power to impart Raman amplification to the optical signals.

11. An undersea optical transmission system, comprising:  
at least first and second cable stations remotely located with respect to one another;  
an undersea optical transmission path optical coupling the first and second cable stations;  
at least one optical repeater located along the optical transmission path;  
wherein at least one of the first and second cable stations includes:  
submarine line terminal equipment (SLTE) for processing terrestrial traffic received from an external source, said SLTE including terrestrial optical transmission equipment receiving the terrestrial traffic and generating optical signals in response thereto, and an interface device providing signal conditioning to the optical signals received from the terrestrial optical transmission equipment

so that the optical signals are suitable for transmission through the undersea optical transmission path;

power feed equipment for supplying electrical power to the repeater;

an element management system for configuring and obtaining status information from the transmission system;

a cable termination box in which the undersea optical transmission path terminates.

12. The undersea optical transmission system of claim 11 wherein said terrestrial optical equipment is a SONET/SDH terminal.

13. The undersea optical transmission system of claim 11 wherein said terrestrial optical equipment is an ATM terminal.

14. The undersea optical transmission system of claim 11 wherein said terrestrial optical equipment is a Gigabit Ethernet terminal.

15. The undersea optical transmission system of claim 11 wherein said undersea optical transmission system is a WDM transmission system.

16. The undersea optical transmission system of claim 11 wherein the interface device is configured to perform at least one signal conditioning process selected from the group consisting of gain equalization, bulk dispersion compensation, optical amplification, Raman amplification, dispersion slope compensation, PMD compensation, load balancing, and performance monitoring.

17. The undersea optical transmission system of claim 11 wherein the external source from which the terrestrial traffic is received is a terrestrial point-of-presence.

18. The undersea optical transmission system of claim 11 wherein said interface device includes line monitoring equipment.

19. The undersea optical transmission system of claim 18 wherein line monitoring equipment is a COTDR arrangement.
20. The undersea optical transmission system of claim 11 wherein said interface device includes means for supplying pump power to impart Raman amplification to the optical signals.
21. The undersea optical transmission system of claim 11 wherein said optical repeater includes at least one rare-earth doped optical amplifier.
22. The undersea optical transmission system of claim 11 wherein said undersea optical transmission path is a WDM transmission path.
23. An undersea optical transmission system, comprising:
  - at least first and second cable stations remotely located with respect to one another;
  - an undersea optical transmission path optical coupling the first and second cable stations;
  - at least one optical repeater located along the optical transmission path;
  - terrestrial optical transmission equipment receiving terrestrial traffic and generating optical signals in response theretowherein at least one of the first and second cable stations includes:
  - an interface device providing signal conditioning to the optical signals received from the terrestrial optical transmission equipment so that the optical signals are suitable for transmission through the undersea optical transmission path;
  - power feed equipment for supplying electrical power to the repeater;
  - an element management system for configuring and obtaining status information from the transmission system;

a cable termination box in which the undersea optical transmission path terminates.

24. The undersea optical transmission system of claim 23 wherein said terrestrial optical equipment is a SONET/SDH terminal.

25. The undersea optical transmission system of claim 23 wherein said terrestrial optical equipment is an ATM terminal.

26. The undersea optical transmission system of claim 23 wherein said terrestrial optical equipment is a Gigabit Ethernet terminal.

27. The undersea optical transmission system of claim 23 wherein said undersea optical transmission system is a WDM transmission system.

28. The undersea optical transmission system of claim 23 wherein the interface device is configured to perform at least one signal conditioning process selected from the group consisting of gain equalization, bulk dispersion compensation, optical amplification, Raman amplification, dispersion slope compensation, PMD compensation, load balancing, and performance monitoring.

29. The undersea optical transmission system of claim 23 wherein the external source from which the terrestrial traffic is received is a terrestrial point-of-presence.

30. The undersea optical transmission system of claim 23 wherein said interface device includes line monitoring equipment.

31. The undersea optical transmission system of claim 30 wherein line monitoring equipment is a COTDR arrangement.

32. The undersea optical transmission system of claim 23 wherein said interface device includes means for supplying pump power to impart Raman amplification to the optical signals.

33. The undersea optical transmission system of claim 23 wherein said optical repeater includes at least one rare-earth doped optical amplifier.

34. The undersea optical transmission system of claim 23 wherein said undersea optical transmission path is a WDM transmission path.

35. A land-based cable station for a terrestrial optical transmission system, comprising:

line terminal equipment (LTE) for processing terrestrial traffic received from an external source;

power feed equipment for supplying electrical power to active components of the transmission system;

an element management system for configuring and obtaining status information from the transmission system;

a cable termination box in which a transmission cable terminates; and

wherein said LTE includes:

terrestrial optical transmission equipment receiving the terrestrial traffic and generating optical signals in response thereto; and

an interface device providing signal conditioning to the optical signals received from the optical transmission equipment so that the optical signals are suitable for transmission through the optical transmission system.

36. The cable station of claim 35 wherein said terrestrial optical equipment is a SONET/SDH terminal.

37. The cable station of claim 35 wherein said terrestrial optical equipment is an ATM terminal.

38. The cable station of claim 35 wherein said terrestrial optical equipment is a Gigabit Ethernet terminal.

39. The cable station of claim 35 wherein said optical transmission system is a WDM transmission system.

40. The cable station of claim 35 wherein the interface device is configured to perform at least one signal process selected from the group consisting of gain equalization, bulk dispersion compensation, optical amplification, Raman amplification, dispersion slope compensation, PMD compensation, load balancing, and performance monitoring.

41. The cable station of claim 35 wherein the external source from which the terrestrial traffic is received is a terrestrial point-of-presence.

42. The cable station of claim 35 wherein said interface device includes line monitoring equipment.

43. The cable station of claim 42 wherein line monitoring equipment is a COTDR arrangement.

44. The cable station of claim 35 wherein said interface device includes means for supplying pump power to impart Raman amplification to the optical signals.

45. The cable station of claim 1 wherein said terrestrial optical equipment is an IP-based router.

46. The cable station of claim 1 wherein the external source from which the terrestrial traffic is received is a remotely located cable station.